REFARMING

Or How the FCC gets more out of less.

Where did this come from?

- Refarming started with “Part 88" rulemaking.
  - Notice of Inquiry issued July, 1991.
  - Notice of Proposed Rulmaking November, 1992 (Docket 92-235)
  - Report and Order issued June, 1995
- Numerous other adjustments and rulemakings have occurred since then.
  - Low power systems
  - Competitive Frequency Coordination
  - Medical devices
  - Most recent rulings

Main Points in Initial Ruling

- Modified technical parameters.
  - Bandwidth
    - 12.5 kHz
    - 6.25 kHz
  - Power based on elevation and service area.
  - Frequency assignment
  - Adjacent channel separation

Main Points of Initial Ruling

- Povided original schedule for implementation.
  - At rulemaking:
    - Power Limits
    - Frequency assignment
    - Adjacent channel separation
  - Based on equipment availability not ability to license
    - New equipment Type Accepted after August 1996 must be dual bandwidth capable.
    - New equipment Type Accepted after January 1, 2005 must include 6.25 kHz.

Recent Ruling

- January 13, 2004 - No new wide band licenses that increase coverage area.
- January 1, 2008 - No new wideband radios manufactured or imported.
- January 1, 2018 - All systems converted to narrowband.
- Eliminated channel aggregation to allow use of TDMA or other multiple use technology.

Petition for reconsideration

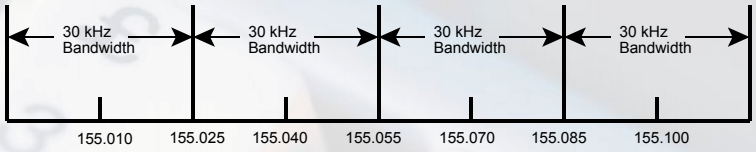
- Allow wide/narrow band operation for mutual aid.
- Eliminates three dates of 2004, 2008, and 2018 and replaces them with a single date of 2013 when all systems must be converted to narrowband.

What does refarming do?

- Refarming is like restriping a parking lot.
- Doesn't give any new spectrum.
- "Creates" more channels from existing spectrum.
- New channels fit in between old channels.
- New channels may interfere with old channels.
- Does not require conversion to digital!

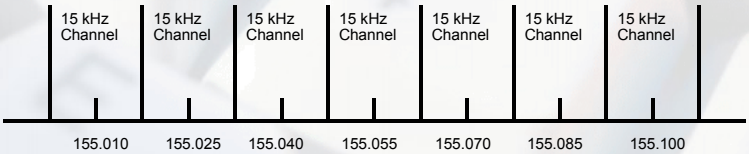
Channel Layout

Pre-Refarming Channel Allocation



Channels actually assigned every 15 kHz but channel bandwidth 30 kHz. Interference controlled by requiring minimum physical separation between adjacent channel base stations. Stations closer than 10-15 miles would most likely cause interference to each other.

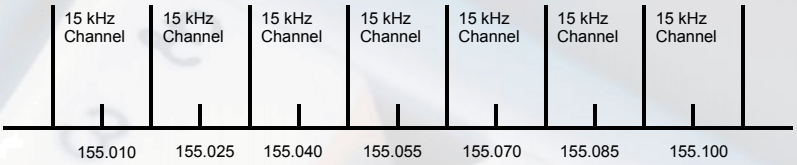
After Refarming Channel Allocation (Phase 1)



Channels still assigned every 15 kHz but channel bandwidth is now 12.5 kHz so channels can be used physically closer together without interference. The problem is that the new channels may cause interference to the older equipment using the 30 kHz wide channels. This is especially true if the new system is using digital modulation.

Channel Layout

After Refarming VHF Channel Allocation (Scenario 1)



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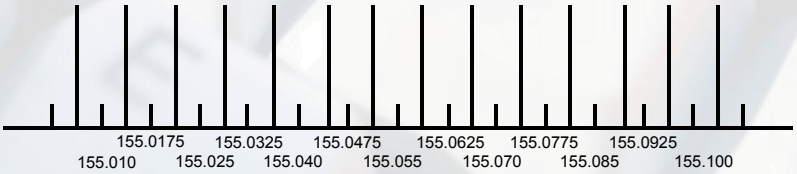
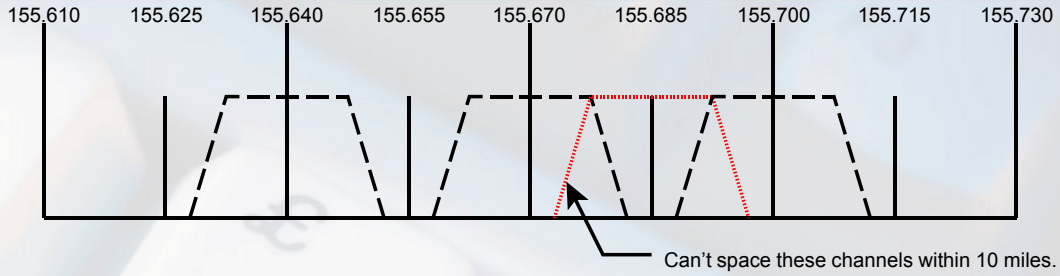
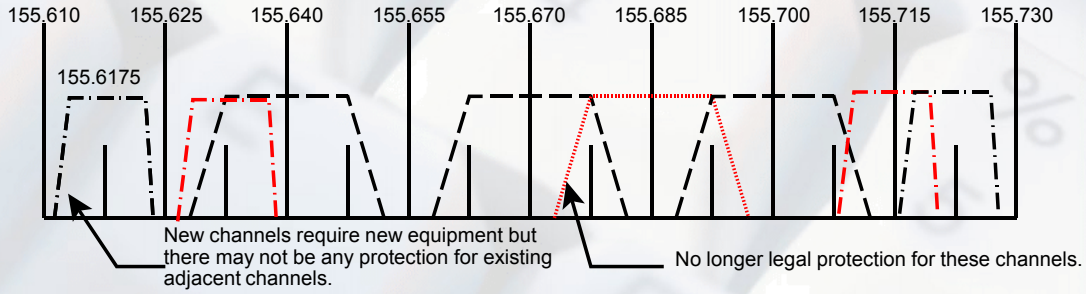
After Refarming VHF Channel Allocation (Scenario 2)



Channels are assigned on 7.5 kHz centers with a bandwitch of 12.5 kHz. This will affect both the old 30 kHz channel equipment and the 15 kHz channel equipment.



BEFORE REFARMING



AFTER REFARMING

Highlights

- Reduces output power levels
  - High sites often limited to 5-20 watts.
- Provide for additional channels when equipment changed
- Reduced power means more base stations
- 12.5 kHz channels now 6.25 kHz in future (future equipment changes)
  - Current modulation technology for 12.5 kHz not compatible with 6.25 kHz
- Reduced modulation means less coverage
- More channels in same spectrum means more interference

Highlights

- Digital if used is more expensive (20-50%).
- Technicians will need to be trained on new technology.
- Some test equipment may need to be replaced.
- Allowance for special/advanced modulation techniques (TDMA)
- Increased number of base stations may require simulcast for easy system operation.